

Simplified High-Performance Roll Out Composite Magnetometer Boom, Phase I

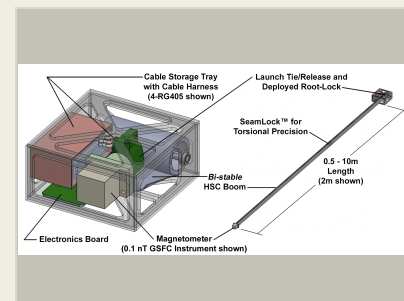
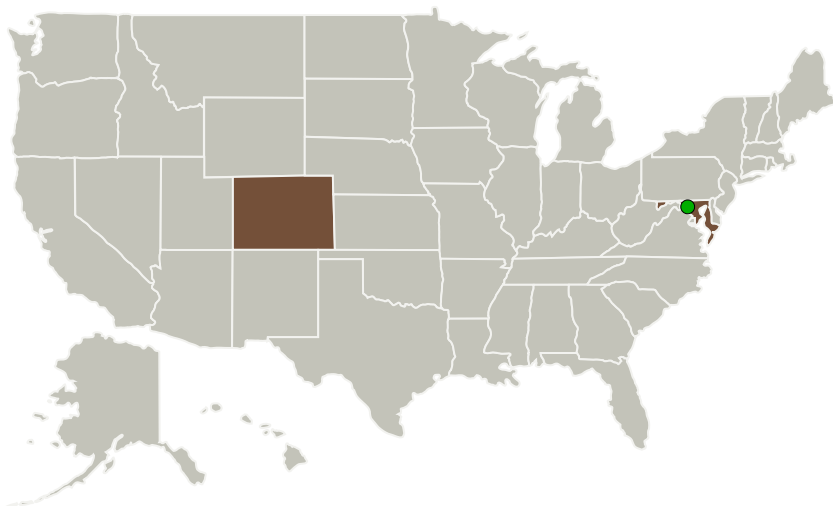
Completed Technology Project (2017 - 2017)



Project Introduction

In response to NASA's need for compact, low-cost deployable magnetometer booms for CubeSats, Rocco proposes to develop a Simple High-performance Roll-Out Composite (SHROC) Magnetometer Boom. The boom is capable of motor-less self-deployment and lock-out through a unique combination of bi-stable composite laminate design and features that increase torsional rigidity and deployed precision at the end of deployment. The boom can be built to diameters ranging between 1.6 cm (5/8 in) and 2.5 cm (1 in) and fully deployed lengths ranging from 0.5 m to 10 m while being packaged in less than 1/2-U volume (10 cm x 10 cm x 5 cm). A launch-retention mechanism is provided to lock the tip-mounted instrument package for launch. For deployment, this launch retention mechanism is released and the strain energy stored within the high-strain composite boom drives the deployment with predictable and nearly constant motive force. The overarching Phase I objective is to conduct a preliminary design-analysis-fabrication-test loop for a SHROC Magnetometer Boom capable of meeting requirements for a variety of future NASA Heliophysics science missions. During Phase II Rocco will address the key engineering development risks, mature the system design to a CDR level of development, and validate performance objectives through a series of ground-based qualification tests on engineering development units. Overall, the anticipated outcome of the combined Phase I/II program is development and proto-flight validation of a SHROC Boom system for a wide range of future Heliophysics missions.

Primary U.S. Work Locations and Key Partners



Simplified High-Performance Roll Out Composite Magnetometer Boom, Phase I Briefing Chart Image

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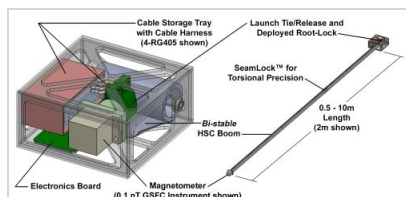


Organizations Performing Work	Role	Type	Location
Roccor, LLC	Lead Organization	Industry	Longmont, Colorado
● Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations

Colorado	Maryland
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Images



Briefing Chart Image

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(<https://techport.nasa.gov/image/132358>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Roccor, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

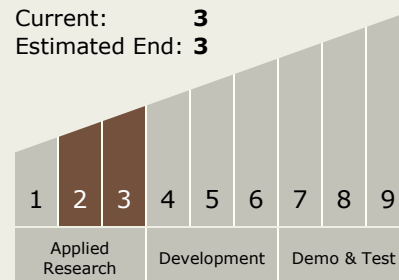
Carlos Torrez

Principal Investigator:

Dana Turse

Technology Maturity (TRL)

Start: 2
Current: 3
Estimated End: 3



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Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.3 In-Situ Instruments and Sensors
 - └ TX08.3.1 Field and Particle Detectors